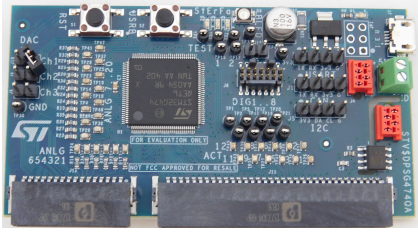
# STEVAL-DPSG474Q

Data brief

## Digital power supply control board based on full pin-count STM32G474QET6



| Product summary | |
|---|---|
| Digital power supply control board based on full pin-count STM32G474QET6 | STEVAL-DPSG474Q |
| Mainstream Arm Cortex-M4 | STM32G474QET6 |
| Applications | Power supplies and converters<br>Digital power<br>Server & telecom power<br>EV charging - DC fast charging stations |

## Features

- Control board for power converters: SMPS, PFC, DC-DC and DC-AC converters
- STM32G474QET6 Arm Cortex®-M4 core-based microcontroller, featuring 512 Kbytes of flash memory and 128 Kbytes of SRAM, in LQFP128 package
- LDO embedded for 5 V supply
- Board connectors
  - 32-pin digital and 68-pin analog main connector
  - USB micro 5 V only
  - STDC14 STLINK programming and debug connector
  - Analog waveform test point
  - Isolated serial COM
  - Expansion board DIG/AN connectors
- ESD protection and filter for MCU pin connections
- Analog and digital pins test points
- Expansion connectors
  - SWIM–UART–$I^2C$ communication protocol connector
  - 14-pin analog and digital connectors
- 3 user LEDs (status–error–fault)
- 1 bicolor LED for full debugging
- Reset button
- Support of a wide choice of integrated development environments (IDEs)
  - IAR™, Keil®, and STM32CubeIDE
- Ecosystem compatibility
  - STM32Cube environment
  - Digital power STMicroelectronics firmware package

## Description

The STEVAL-DPSG474Q is a control board dedicated to digital power applications. It can control the power stage of converters requiring high pin counting (PFC, DC-DC, DCAC), or can be used to control the dual stage conversion (PFC+DCDC).

The STEVAL-DPSG474Q consists of a platform based on the STM32G474QE microcontroller from the STM32G4 family.

The STM32G474QE microcontroller includes the high-performance Arm® Cortex®-M4 32-bit RISC core operating at up to 170 MHz frequency, a floating-point unit (FPU), a full set of DSP (digital signal processing) instructions, and high-speed embedded memories (512 Kbytes of flash memory and 128 Kbytes of SRAM).

The device embeds peripherals that allow mathematical/arithmetic function acceleration (CORDIC for trigonometric functions and FMAC unit for filter functions).

The MCU offers: five fast 12-bit ADCs (5 Msps), seven ultrafast comparators, six operational amplifiers, seven DAC channels (three external and four internal), a low-power RTC, 32-bit timers, three timers dedicated to motor control, seven general-purpose 16-bit timers, one 16-bit low-power timer, and the high-resolution timer (HRTIM) with 184 ps resolution, specifically designed to drive power conversion systems.

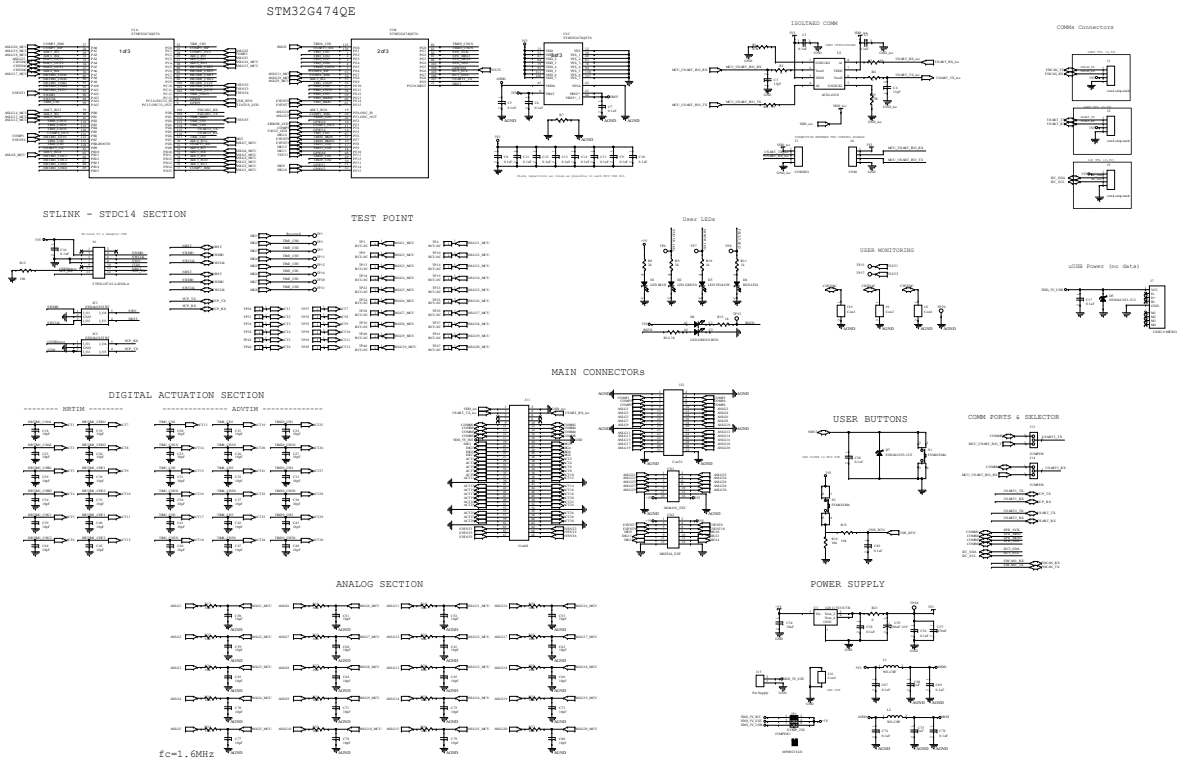
The main connector embeds two sections for separate analog and digital behavior, with 32 pins and 68 pins respectively. It provides all the PWM control signals, sensing networks, and protection features needed for a wide range of digital power supply applications.

A full pin-count STM32G474QE solution, in addition to the sophisticated embedded hardware accelerator, and powerful Arm® core, enables handling complex digital power converters like multilevel and multistage structures. Several connectors also allow extending the capability of this platform in terms of I/O, communication, telemetry, debugging, and control plus protection features.

Full integration into the STM32Cube environment and digital power ST firmware package support allow implementing and deploying digital power converter control with a dedicated architecture and control features, to evaluate several turnkey control structures. Additional embedded debugging features such as LEDs and analog, digital test points maximize the design capability for the user.

# 1 Schematic diagrams

**Figure 1. STEVAL-DPSG474Q circuit schematic**



# 2 Board versions

**Table 1. STEVAL-DPSG474Q versions**

| Finished good | Schematic diagrams | Bill of materials |
|---|---|---|
| STEVAL$DPSG474QA(1) | STEVAL$DPSG474QA schematic diagrams | STEVAL$DPSG474QA bill of materials |

1. *This code identifies the STEVAL-DPSG474Q evaluation board first version.*

## Revision history

Table 2. **Document revision history**

| Date | Revision | Changes |
|---|---|---|
| 04-Jun-2025 | 1 | Initial release. |